

Proceedings of the American Academy of Arts and Sciences.

VOL. XLIII. No. 22. — JULY, 1908.

RECORDS OF MEETINGS, 1907-1908.

REPORT OF THE COUNCIL: BIOGRAPHICAL NOTICE.

SAMUEL CABOT. BY CHARLES LOBING JACKSON.

OFFICERS AND COMMITTEES FOR 1908-1909.

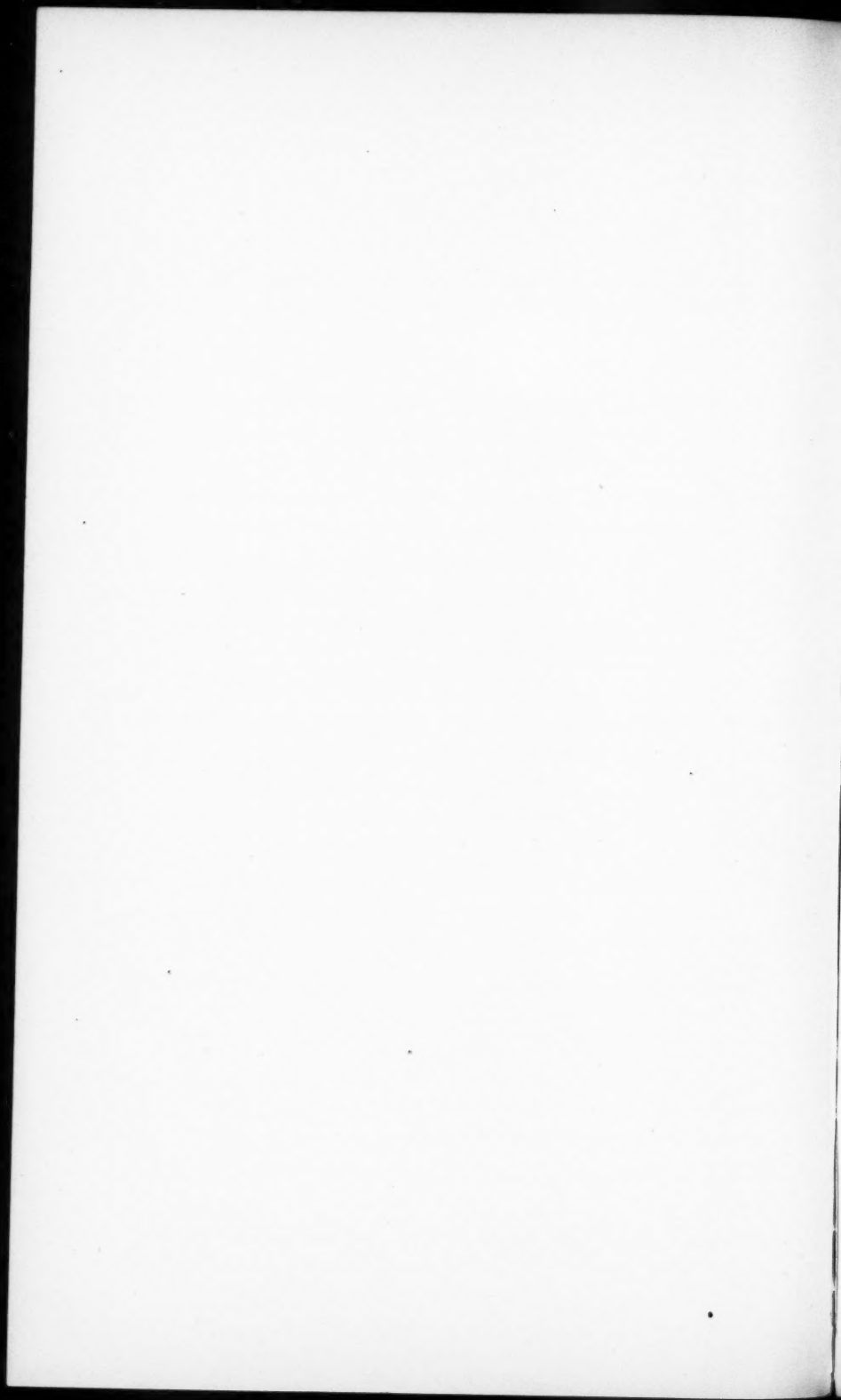
LIST OF THE FELLOWS AND FOREIGN HONORARY
MEMBERS.

STATUTES AND STANDING VOTES.

RUMFORD PREMIUM.

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RECORDS OF MEETINGS.

Nine hundred seventy-fifth Meeting.

OCTOBER 9, 1907. — STATED MEETING.

The PRESIDENT in the chair.

There were present twenty-four Fellows.

The Corresponding Secretary, *pro tempore*, read letters from G. W. Pierce, accepting Fellowship; from the California Academy of Sciences, thanking the Academy for the contribution of its publications; from Arthur McDonald, asking the Academy to form resolutions regarding the establishment of laboratories for the study of the criminal, pauper, and defective classes, and transmitting a pamphlet on the subject; from C. van Overbergh, Directeur général de l'Administration de l'Enseignement Supérieur des Sciences et des Lettres, enclosing a copy of the report of the International Congress for the Study of the Polar Regions, and requesting the publications of the Academy; from St. C. Hepites and I. St. Murat, notifying the Academy of their appointment as Directors of the Roumanian Meteorological Institute and Service Central des Poids et Mesures; from Vilh. Thomsen, President of the International Congress of Orientalists, inviting the Academy to send delegates to the Fifteenth Congress, in August, 1908; from President Capellini, two communications relative to the celebration of the anniversary of the death of Aldrovandi; from the Société Géologique de Belgique, notifying the Academy of the death of its Secretary, Henri-Joseph Fourir; from the Astrophysical Observatory, Potsdam, notifying the Academy of the death of H. C. Vogel; from the Kön. böhmische Gesellschaft der Wissenschaften, notifying the Academy of the death of Johann Gebauer, and also of the death of J. Bohuslav, Freih. v. Rieger.

The Chair announced the following deaths:—

Charles F. Folsom, Resident Fellow, of Class II, Section 4;
H. C. Vogel, Foreign Honorary Member of Class I, Section 1;
and of Henry G. Denny, a former Resident Fellow.

On the recommendation of Professor Webster, it was

Voted, That an unexpended balance of \$93.46 from the income of the Rumford Fund, returned by Professor Edwin H. Hall, be reappropriated to the use of the Rumford Committee.

The following gentlemen were elected Resident Fellows of the Academy:—

James Flack Norris, of Boston, in Class I, Section 3 (Chemistry).

William Hultz Walker, of Newton, in Class I, Section 3 (Chemistry).

Mr. A. T. Thompson showed the use of his reflectoscope in projecting photographs and opaque objects upon the screen.

On motion of the Recording Secretary, it was

Voted, That the thanks of the Academy be tendered to Mr. Thompson for his interesting exhibition of the reflectoscope.

Dr. Theodore Lyman gave a paper entitled "The Absorption of the Air for Light of very Short Wave Lengths."

The following paper was presented by title:—

"Difference in Wave Lengths of Titanium $\lambda\lambda$ 3900 and 3913 in Arc and Spark." By Norton A. Kent and Alfred H. Avery. Presented by John Trowbridge.

Nine hundred seventy-sixth Meeting.

NOVEMBER 13, 1907.

VICE-PRESIDENT WALCOTT in the chair.

There were present twenty-seven Fellows.

The following letters were read:—

From Wm. H. Walker, accepting Fellowship; from Dr. G. Hellman, announcing his appointment as Director of the Kön. Preuss. Meteorologisches Institute of Berlin; from the Verein für Naturwissenschaft in Braunschweig, announcing the death of Professor Dr. Rudolf Blasius.

The Chair announced the following deaths:—

Edward G. Gardiner, Resident Fellow in Class II, Section 3.

Sir Benjamin Baker, Foreign Honorary Member in Class I, Section 4.

The following communications were given:—

“The Volcanoes of the Azores.” By Professor W. H. Pickering.

“The Linnaean Celebration at Upsala, Sweden.” By Professor W. G. Farlow.

The following paper was read by title:—

“A Revision of the Atomic Weight of Lead. Preliminary Paper: The Analysis of Lead Chloride.” By Gregory Paul Baxter and John Hunt Wilson.

Nine hundred seventy-seventh Meeting.

DECEMBER 11, 1907.

The PRESIDENT in the Chair.

There were present seventeen Fellows.

Letters were read from Arthur I. Davenport, announcing the death of his father, George E. Davenport; from the Sixteenth International Congress of Americanists, inviting the Academy to send delegates.

The Chair announced the death of George E. Davenport, Resident Fellow in Class II, Section 2, and also of Professor Minton Warren, whose nomination had been read to the Academy at its last meeting.

On motion of Professor Davis, it was

Voted, That in reference to the death of Professor Warren the President be authorized to take such action as he thinks proper.

On motion of Professor Davis, it was

Voted, That the House Committee be authorized to provide a simple collation for the Members at the meetings of the Academy.

The following communications were given:—

“The Most Recent Exploration in Palestine.” By Professor D. G. Lyon.

“The Centenary Celebration of the Geological Society of London.” By Professor W. M. Davis.

The following papers were presented by title:—

"The Influence of Hysteresis upon the Manner of Establishment of a Steady Current in the Primary Circuit of an Induction Coil." By B. O. Peirce.

"Some Effects of Heavy Pressure on Arc Spectra." By W. J. Humphreys. Presented by C. R. Cross.

"The Effect of a Magnetic Field on the Cathode Rays." By John Trowbridge.

Nine hundred seventy-eighth Meeting.

JANUARY 8, 1908.—STATED MEETING.

The PRESIDENT in the chair.

There were present twenty Fellows.

Letters were read from the Secretaries of the Third International Congress for the History of Religions, enclosing the first announcement of the Meeting to take place at Oxford in September, 1908, and inviting the Academy to send a Representative; from the Physikalische Verein of Frankfort, informing the Academy of the opening of the new Institute Building, and inviting the Academy to send Delegates; from the Committee of Organization, informing the Academy of the First Congress of Chemistry and Physics to be held at St. Petersburg in January, in memory of D. I. Mendéléeff.

The following deaths were announced by the Chair:—

Lord Kelvin, Foreign Honorary Member in Class I, Section 4; Charles A. Young, Associate Fellow in Class I, Section 1; Thomas D. Seymour, Associate Fellow in Class III, Section 2.

The following Delegates were appointed to represent the Academy at the Fifteenth International Congress of Orientalists, to be held at Copenhagen in August, 1908:—

Charles R. Lanman, George F. Moore.

In answer to an inquiry by Professor Webster, on motion of Colonel Livermore, it was

Voted, That the Corresponding Secretary be requested to ascertain and report to the Academy on the measures to be taken in reference to the Nobel Prizes.

Le Baron Russell Briggs was elected a Resident Fellow in Class III, Section 4 (Literature and the Fine Arts).

The following communications were presented:—

“Cretan Chronology.” By President W. W. Goodwin.

“The Polariscope and the Weather.” By Dr. Louis Bell.

The following paper was read by title:—

“A Simple Method of Measuring the Intensity of Sound.”

By George W. Pierce.

Nine hundred seventy-ninth Meeting.

FEBRUARY 12, 1908.

The CORRESPONDING SECRETARY *pro tempore* in the chair.

There were present twenty-four Fellows.

Letters were read from the Sub-director of the Museo Nacional, Mexico, felicitating the Academy on the New Year; from the Committee of the Fourth International Congress of Mathematicians to be held at Rome, April 6-11, 1908.

The death of Edward H. Strobel, Resident Fellow in Class III, Section 1, was announced.

The following report of the House Committee was read and accepted:—

“At the meeting of the Academy held on the eleventh of December, the House Committee were instructed to consider and report whether it would be advisable for the Academy to provide a light repast, consisting of crackers, ale, and cheese, at the conclusion of the meetings.

“We find that the expense involved would be about twenty-five dollars for tables and dishes, and an annual outlay of about twenty-five dollars. After consulting the Treasurer, we recommend that these sums be expended, the initial outlay being paid by the appropriation for House expenses, and the current expense charged to the appropriation for the expense of meetings.

“The Committee have, as has been announced, provided a ventilator in the meeting-room, with an air-shaft reaching above the roof, which it is hoped will prove effective. If not, it can be made more so by putting an electric fan into the air-shaft.

“Meanwhile it has been urged upon them that the present meeting-room shall be given up, and a larger and pleasanter one be constructed in the front of the house in the third story. A room could be made covering about six hundred and fifteen square feet, about a third more

than the area of the present room, which covers four hundred and sixty-five square feet. The cost would be about thirteen hundred dollars (\$1300), a larger sum, considerably, than the means at the Treasurer's command can supply. But if the ventilation now proposed proves on trial unsatisfactory, and it is found that the cost of these changes can be raised, as has been suggested, by subscription, and, at the close of the season, the Academy so vote, the alteration can be made in the course of the summer."

On motion of Professor Webster, and seconded by Professor Kinnicutt, it was

Voted, That the House Committee be requested to consider the question of raising funds for the carrying out of the plans for a meeting-room on the third floor.

Professor George F. Moore was appointed a Delegate to the Third International Congress for the History of Religions, to be held at Oxford in September, 1908.

Professor Jaggar informed the Academy that there was a bill pending in the Legislature for a new topographical survey of the State.

Professor T. A. Jaggar gave the following communication: —
"Volcanoes of the Aleutian Islands."

The following papers were read by title: —

"Measurements of the Internal Temperature Gradient in Common Materials." By Charles B. Thwing. Presented by C. R. Cross.

"The Variation of the Thermomagnetic Effect in Soft Iron with Strength of the Magnetic Field and Temperature Gradient." By L. L. Campbell. Presented by John Trowbridge.

Nine hundred eightieth Meeting.

MARCH 11, 1908. — STATED MEETING.

VICE-PRESIDENT TROWBRIDGE in the chair.

There were present twelve Fellows.

Letters were read from L. B. R. Briggs, accepting Fellowship; from William W. Goodwin, declining re-election as President of the Academy; from the Geological Society of London, thanking the Academy for delegating Professor W. M. Davis

to attend its centenary, and presenting to the Academy the volume, "The History of the Geological Society of London"; from the Académie des Sciences, Agriculture, Arts et Belles-Lettres, of Aix, requesting delegates from the Academy to attend the celebration of the centenary of its Reconstitution; from the Gesellschaft von Freunden der Naturwissenschaften, notifying the Academy of its fiftieth anniversary.

The Chair announced the following deaths:—

Asaph Hall, Class I, Section 1; Israel C. Russell, Class II, Section 1; Augustus St. Gaudens, Class III, Section 4; E. C. Stedman, Class III, Section 4, Associate Fellows.

The Chair appointed for Nominating Committee:—

Charles R. Cross, of Class I.

Charles S. Minot, of Class II.

Morris H. Morgan, of Class III.

It was

Voted, To meet on adjournment on the second Wednesday in April.

Dr. G. H. Parker presented the communication:—

"The Influence of Light on the Daily Activities of Animals."

The following papers were read by title:—

"The Damping of the Quick Oscillations of a Twisted Fibre by the Resistance of the Air and by the Torsional Forces." By B. O. Peirce.

"Notes on Superheated Steam: I, Its Specific Heat; II, Its Total Heat; III, Its Joule-Thomson Effect." By Harvey N. Davis. Presented by W. C. Sabine.

"The Sensory Reactions of Amphioxus." By G. H. Parker.

"On Delays before *ἀναρροπίσεις* in Greek Tragedy." By W. P. Dickey. Presented by M. H. Morgan.

Nine hundred eighty-first Meeting.

APRIL 8, 1908.—ADJOURNED STATED MEETING.

The Academy met by invitation of Professor Elihu Thomson at the Algonquin Club, 217 Commonwealth Avenue.

VICE-PRESIDENT TROWBRIDGE in the chair.

There were present forty-nine Fellows and four guests.

The following gentlemen were elected members of the Academy:—

Louis Derr, of Brookline, as Resident Fellow in Class I, Section 2 (Physics).

John Ulric Nef, of Chicago, as Associate Fellow in Class I, Section 3 (Chemistry).

On the recommendations of the Recording Secretary, the Chairman of the Rumford Committee, and the Chairman of the Publishing Committee, it was

Voted. To make the following appropriations: From the income of the General Fund, for House expenses, \$425; for Books and binding, \$340; for Meeting expenses, \$35; from the income of the Rumford Fund, for the furtherance of research, \$141.90 (the unexpended balance of a previous grant); from the income of the Publication Fund for publication, \$800.

Vice-President Trowbridge announced that the Rumford Premium had been awarded to Mr. Edward Goodrich Acheson for the application of heat in the electric furnace to the industrial production of carborundum, graphite, and other new and useful substances. He then called upon the chairman of the Rumford Committee, Professor Charles R. Cross, who gave a short account of the previous awards of the Rumford Medal, followed by a brief analysis of Mr. Acheson's work and the circumstances which influenced the Committee to recommend the award to him.

Vice-President Trowbridge then presented the medal in the name of the Academy to Mr. Acheson, who expressed his appreciation of the honor conferred upon him, saying: "The medal has been a great incentive to me from boyhood, and I had hoped sometime to attain it. To-night my dream has come true."

On the invitation of the Chair he then gave an account in detail of his discoveries, illustrated by a number of interesting demonstrations.

The following papers were presented by title:—

"The Invariants of Linear Differential Expressions." By Frank Irwin. Presented by Maxime Bôcher.

"Contributions toward a Monograph of the Laboulbeniaceae. Part II." By Roland Thaxter.

Nine hundred eighty-second Meeting.

MAY 13, 1908.—ANNUAL MEETING.

VICE-PRESIDENT WALCOTT in the chair.

There were present twenty-eight Fellows.

Letters were read from Thomas Dwight, Theodore Hough, and Arthur Michael, resigning Fellowship; from Louis Derr, accepting Fellowship; from the Third International Congress of Botany, two circulars referring to the Congress.

The death of Gustavus Hay, Resident Fellow in Class I, Section 1, was announced by the Chair.

The annual report of the Council was read.¹

The annual report of the Treasurer was read, of which the following is an abstract:—

GENERAL FUND.

Receipts.

Investments	\$2,833.37	
Assessments	1,830.00	
Admission fees	70.00	
Rent of offices	<u>1,204.00</u>	\$5,933.41

Expenditures.

General expenses	\$3,034.25	
Library	1,759.67	
Income transferred to principal	<u>758.49</u>	\$5,552.41
Balance, April 30, 1908		<u>381.00</u>
		\$5,933.41

RUMFORD FUND.

Receipts.

Balance, April 30, 1907	\$ 186.86	
Investments	<u>3,027.90</u>	\$3,214.76

¹ See p. 547.

Expenditures.

Research	\$1,200.00	
Publication	571.99	
Library	222.74	
Medal	341.50	
Income transferred to principal	127.35	\$2,463.58
Balance, April 30, 1908		<u>751.18</u>
		\$3,214.76

C. M. WARREN FUND.

Receipts.

Balance, April 30, 1907	\$ 762.97	
Investments	<u>700.33</u>	\$1,463.30

Expenditures.

Research	\$ 150.00	
Vault rent	4.00	
Premium on bonds charged off	90.00	
Income transferred to principal	241.37	\$ 485.37
Balance, April 30, 1908		<u>977.93</u>
		\$1,463.30

PUBLICATION FUND.

Receipts.

Balance, April 30, 1907	\$ 212.84	
Investments	3,179.02	
Sale of publications	<u>148.20</u>	\$3,540.06

Expenditures.

Publication	\$3,046.55	
Vault rent	12.50	
Income transferred to principal	136.71	\$3,195.76
Balance, April 30, 1908		<u>344.30</u>
		\$3,540.06

The following reports were also presented :—

REPORT OF THE LIBRARIAN.

Of the library catalogue there remains to be done the serial publications on general science, comprising the two lower floors of the stack building; and the few books on literature, the fine arts, and religion. The Academy is fortunate in having this work done by so accomplished a cataloguer as Miss Wyman, and at such a moderate cost, the last advantage resulting from the fact that Miss Wyman gives only a portion of her time to the Academy.

The Assistant Librarian is endeavoring to complete the sets of Society publications now in the library by sending to the various societies a request for each missing number, and offering in return to complete their sets of the Academy's publications. In a great many cases the request is complied with, in others the numbers requested are scarce or out of print. These could perhaps be purchased of second-hand booksellers were money available for the purpose. This lack of money is much to be regretted, as in time it will be practically impossible to purchase them.

The accessions during the year have been as follows :—

	Vols.	Parts of Vols.	Pams.	Maps.	Total.
By gift and exchange . . .	234	2076	76	5	2391
By purchase — General Fund	12	538			550
By purchase — Rumford Fund	5	327			332
Total	251	2941	76	5	3273

The bound volumes in the library have been counted since the last report, and there are now 29,089 volumes. Hereafter in this report the accessions will be given in volumes, and not by parts, as heretofore, and will represent the volumes placed on the shelves during the preceding year.

80 books have been borrowed from the library by 24 persons, including 13 Fellows, and two libraries (Clark University and the University of Cincinnati).

All books borrowed during the year have been returned for the annual examination. Of the books reported as still out a year ago, all have been returned.

The expenses charged to the library are as follows : Miscellaneous, \$519.67 (which includes \$175.93 for cataloguing) ; Binding, \$585.55 General, and \$56.35 Rumford, Funds ; Subscriptions, \$654.45 General, and \$142.75 Rumford, Funds ; making a total of \$1240.00 for the

General, and \$199.10 for the Rumford Funds, as the cost of subscriptions and binding. Of the appropriation of \$50.00 from the Rumford Fund for books, five have been purchased at a cost of \$23.64.

Although \$585.55 from the income of the General Fund was spent for binding, there are still 400 volumes waiting to be bound. There has never been an adequate amount appropriated for binding, and we are now exchanging with more societies and universities than ever before. Societies are now publishing more volumes, and these contain more plates than formerly, which makes the binding more expensive.

A. LAWRENCE ROTCH, *Librarian*.

May 13, 1908.

REPORT OF THE RUMFORD COMMITTEE.

From the amount available for the purpose, the Committee during the year 1907-08 has made grants as follows, for the furtherance of researches in light and heat:—

June 12, 1907. P. W. Bridgman, of the Jefferson Physical Laboratory, for the continuation of his work on the optical and thermal properties of bodies under extreme pressure . . . \$400

Oct. 9, 1907. P. W. Bridgman, in addition to the above appropriation, for the same purpose . . . 400

Jan. 8, 1908. Dr. L. J. Henderson, of the Harvard Medical School, in aid of his research on a new method for the direct determination of physiological heats of reaction . . . 200

Feb. 12, 1908. Professor Joel Stebbins, of the University of Illinois, for his research on the use of selenium in photometry . . . 100

Feb. 12, 1908. Mr. Willard J. Fisher, of Cornell University, for his research on the viscosity of gases . . . 100

Reports stating the progress of their respective investigations have been received from Messrs. P. W. Bridgman, A. L. Clark, E. B. Frost, L. J. Henderson, L. R. Ingersoll, N. A. Kent, F. E. Kester, H. W. Morse, E. F. Nichols, A. A. Noyes, J. A. Parkhurst, T. W. Richards, R. W. Wood.

Since the last annual meeting the following papers have been published at the expense of the Rumford Fund, the first-mentioned in the Memoirs, the others in the Proceedings:—

"High Electromotive Force." John Trowbridge, May, 1907.

"Studies on Fluorite: IV, The Kathodo-Luminescence of Fluorite." H. W. Morse. June, 1907.

"The Physiological Basis of Illumination." L. Bell. September, 1907.

"The Transition Temperature of Manganous Chloride: A New Fixed Point in Thermometry." T. W. Richards and F. Wrede. November, 1907.

"Difference in Wave-Lengths of Titanium $\lambda\lambda$ 3900 and 3913 in Arc and Spark." N. A. Kent and A. H. Avery. November, 1907.

"Note on Some Meteorological Uses of the Polariscope." L. Bell. March, 1908.

At its meeting of Jan. 8, 1908, the Committee, at the request of the Librarian, voted an appropriation of \$50 for the binding of books and periodicals relating to light and heat.

The Committee is endeavoring to make a complete list of all apparatus purchased in past years through appropriations from the Rumford Fund, and hence at present the property of the Academy, to the end that such apparatus, if suitable, may be available for purposes of research in the future.

CHARLES R. CROSS, *Chairman*.

May 13, 1908.

REPORT OF THE C. M. WARREN COMMITTEE.

The C. M. Warren Committee beg leave to report that grants have been made during the past year to the following persons, in aid of the researches specified:—

Dr. Frederic Bonnet, Jr., Worcester Polytechnic Institute . . \$150

"The Effect of Lanthanum, Cerium, and Neodymium Oxides upon Porcelain Glazes, especially as regards their Electrical Conductivity."

Professor James F. Norris, Simmons College 250

"A Study of the Structure of Triphenyl Methyl."

The work of Professor J. Bishop Tingle on the "Study of the Action of Certain Secondary Amines on Camphoroxalic Acid," to aid which research a grant of \$50 was made by the Warren Committee in 1907, has been published in the American Chemical Journal, and acknowledgment made in the paper for the grant received from the Warren Committee.

A report of the progress made has also been received from Dr. Frederic Bonnet, Jr., and the result of his investigations will, it is hoped, be published the coming year.

LEONARD P. KINNICUTT, *Chairman*.

May 13, 1908.

REPORT OF THE PUBLICATION COMMITTEE.

Between May 1, 1907, and May 1, 1908, there were published of the Proceedings, three numbers of Volume XLII (Nos. 27-29), and sixteen numbers of Volume XLIII; also one biographical notice, — in all 567 + v pages and four plates. Five numbers of Volume XLIII (Nos. 1, 4, 10, 11, and 15) were paid for from the income of the Rumford Fund.

There has also been published, at the expense of the Rumford Fund, one Memoir (Volume XIII, No. 5, pp. 188-215, plates xxv-xxvii).

There are in press two numbers of the Proceedings; and an extensive Memoir of some three hundred pages, illustrated with forty-four plates, is in type. This will complete Volume XIII of the Memoirs.

The Academy placed at the disposal of the Publication Committee, from the income of the Publication Fund, \$3200. Of this amount, \$3046.55 have been paid by the Treasurer on bills approved by the chairman of the Committee, leaving a balance of \$153.45.

Bills aggregating \$473.51 incurred in publishing Rumford papers have been forwarded to the chairman of the Rumford Committee for approval.

REPORT OF HOUSE COMMITTEE.

During the last year the lower story of the Academy's House has been occupied by the three physicians to whom it has been leased; the second story by the Academy itself, the Meeting Room being in the rear, and the Reception Room and the Librarian's Office being in the front; the third story by the dwelling rooms of the Assistant Librarian, and the fourth story by storerooms and workroom, and a bedroom for the Janitor. Under this arrangement the building has been almost constantly occupied in one part or another, and its contents have been properly guarded.

The bills approved by the Secretary of the Academy and the Chairman of this Committee, and paid by the Treasurer, have amounted to \$1624.62, of which \$1200 was especially appropriated at the beginning of the year, and the balance, amounting to \$414.62, was made up from unappropriated funds in the hands of the Treasurer by a subsequent vote of the Academy. These amounts include \$11.50 spent for the tables and dishes used for the slight repasts which have been furnished to the members at the close of the meetings. The sum of \$16.02, which has been the total cost of five such entertainments, coming to about \$3.30 apiece, has been charged to the expense of the meetings.

The Committee have spent \$163.77 in improving the ventilation of the Meeting Room, an amount included in the previous statement.

The ventilation will probably be still further improved by the change recently made in the seating, which will enable the southern windows to be opened. This will, we expect, make the ventilation entirely satisfactory.

But some objection has also been made to the general aspects of the Meeting Room and its somewhat contracted appearance. The Academy accordingly at the February meeting directed this Committee to consider and report upon the practicability of building a somewhat larger Meeting Room in the front of the third story, over the present Reception Room. We find that this could be done at a cost of between \$1200 and \$1500, the new room promising to be about one-third larger than the present one.

But as the Academy has not this amount of money in hand, and, as the leases of the first floor will expire within a reasonable time, we think that it would be better for the Academy to try meanwhile to raise money enough to enable it to dispense with the leasing of the first floor and to fit up a commodious meeting room there, and we recommend that steps be taken towards this end.

WILLIAM R. WARE, *Chairman.*

May 13, 1903.

FINANCIAL REPORT OF THE COUNCIL.

The income for the year 1908-09, as estimated by the Treasurer, is as follows :—

GENERAL FUND	{ Investments	\$1786.97	
	{ Assessments	1800.00	
	{ Rent of offices	900.00	\$4486.97
PUBLICATION FUND	{ Appleton Fund investments	\$ 559.52	
	{ Centennial Fund investments	2236.75	\$2796.27
RUMFORD FUND	Investments		\$2698.04
WARREN FUND	Investments		\$ 632.83

The above estimates, less 5 per cent to be added to the capital, leaves an income available for appropriation as follows :—

General Fund	\$4262.62
Publication Fund	2656.46
Rumford Fund	2563.14
Warren Fund	601.19

The following appropriations are recommended : —

GENERAL FUND.

House expenses	\$1200	
Library expenses	1600	
Books, periodicals, and binding	900	
Expenses of meetings	250	
Treasurer's office	150	\$4100

PUBLICATION FUND.

Publication	\$2400
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RUMFORD FUND.

Research	\$1000	
Periodicals and binding	150	
Books and binding	50	
Publication	700	
To be used at discretion of Committee	663	\$2563

C. M. WARREN FUND.

Research	\$ 500
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In accordance with the recommendations in the foregoing report it was

Voted, To appropriate for the purposes named the following sums : —

From the income of the General Fund . . .	\$4100
From the income of the Publication Fund . .	2400
From the income of the Rumford Fund . . .	2563
From the income of the C. M. Warren Fund .	500

On the motion of the Treasurer, it was

Voted, That the assessment for the ensuing year be ten dollars (\$10).

The annual election resulted in the choice of the following officers and committees : —

JOHN TROWBRIDGE, *President*.
 ELIHU THOMSON, *Vice-President for Class I*.
 HENRY P. WALCOTT, *Vice-President for Class II*.
 JOHN C. GRAY, *Vice-President for Class III*.
 EDWIN H. HALL, *Corresponding Secretary*.

WILLIAM WATSON, *Recording Secretary*.
 CHARLES P. BOWDITCH, *Treasurer*.
 A. LAWRENCE ROTCH, *Librarian*.

Councillors for Three Years.

WILLIAM L. HOOPER, of Class I.
 HAROLD C. ERNST, of Class II.
 FREDERIC J. STIMSON, of Class III.

Finance Committee.

JOHN TROWBRIDGE,
 ELIOT C. CLARKE,
 FRANCIS BARTLETT.

Rumford Committee.

CHARLES R. CROSS, ARTHUR G. WEBSTER,
 EDWARD C. PICKERING, ELIHU THOMSON,
 ERASMUS D. LEAVITT, THEODORE W. RICHARDS,
 LOUIS BELL.

C. M. Warren Committee.

LEONARD P. KINNICUTT, CHARLES R. SANGER,
 ROBERT H. RICHARDS, ARTHUR A. NOYES,
 HENRY P. TALBOT, THEODORE W. RICHARDS,
 GEORGE D. MOORE.

The following standing committees were chosen:—

Publication Committee.

WALLACE C. SABINE, of Class I, EDWARD L. MARK, of Class II,
 CRAWFORD H. TOY, of Class III.

Library Committee.

HARRY M. GOODWIN, of Class I, SAMUEL HENSHAW, of Class II,
 HENRY W. HAYNES, of Class III.

Auditing Committee.

A. LAWRENCE LOWELL, FREDERIC J. STIMSON.

House Committee.

WILLIAM R. WARE, A. LAWRENCE ROTCH,
 MORRIS H. MORGAN.

On motion of the Recording Secretary, the following Resolution was unanimously adopted:—

Resolved, That the Fellows of the American Academy desire to place upon record their grateful appreciation of the services of their retiring President, William W. Goodwin, during the five years in which he has presided over their deliberations.

The following gentlemen were elected members of the Academy:

Douglas Wilson Johnson, of Cambridge, as Resident Fellow in Class II., Section 1 (Mathematics and Astronomy).

Charles Hyde Warren, of Auburndale, as Resident Fellow in Class II., Section 1.

Emil Fischer, of Berlin, as Foreign Honorary Member in Class I., Section 3 (Chemistry), in place of the late D. Mendeleeff.

Professor A. G. Webster gave a communication entitled: "Absolute Measurements of Sound."

The following papers were presented by title:—

"A new Method of Determining the Specific Heats of Solutions. By T. W. Richards and A. W. Rowe.

"Positive Rays." By John Trowbridge.

"Variation of the Thermomagnetic Effect in Soft Iron." By L. L. Campbell. Presented by John Trowbridge.

"The Latent Heat of Fusion and the Specific Heat in the Solid and Liquid State of Salts Melting below 600° C." By H. M. Goodwin and H. T. Kalmus.

"Pisistratus and his Edition of Homer." By Samuel Hart Newhall. Presented by M. H. Morgan.

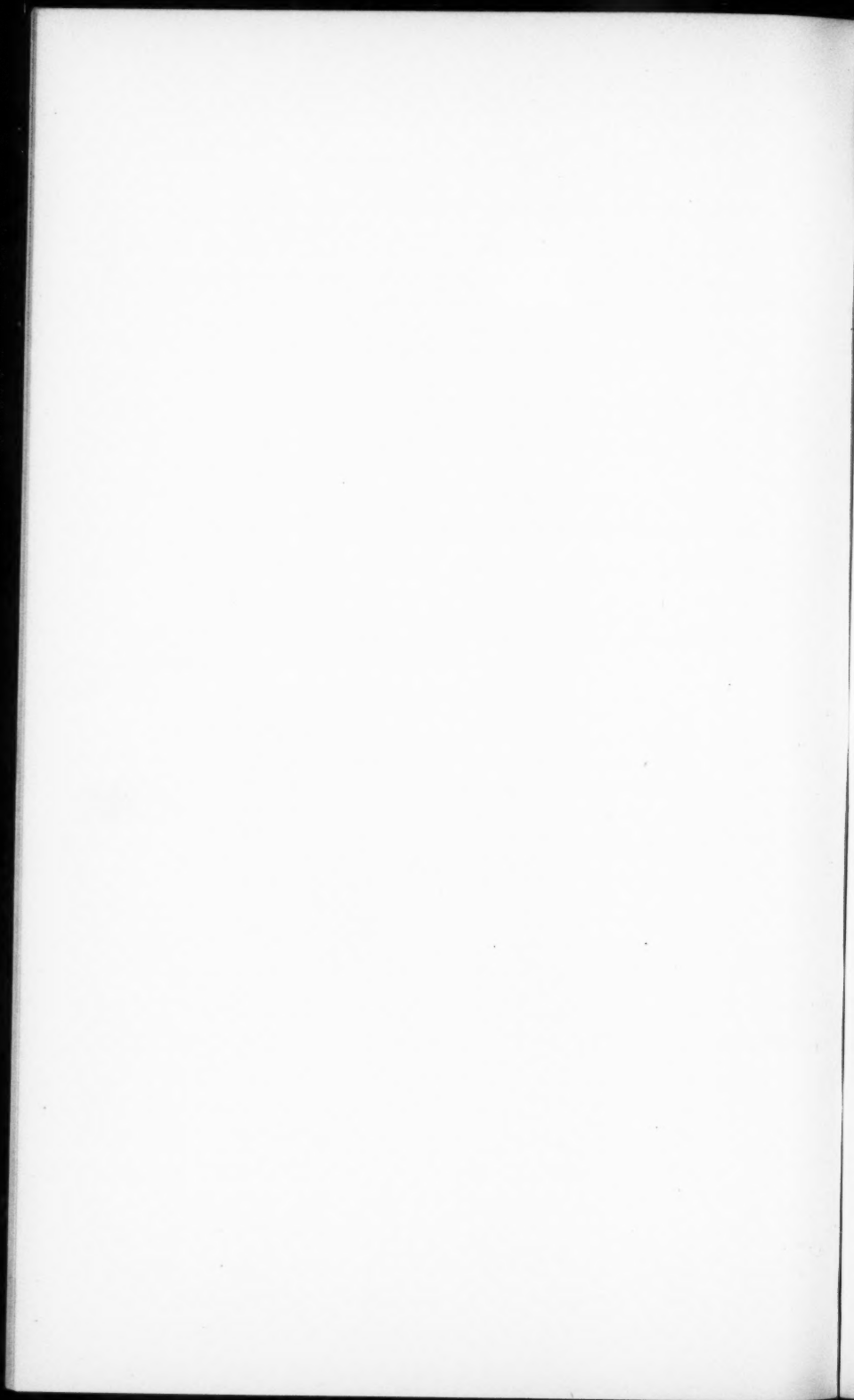
AMERICAN ACADEMY OF ARTS AND SCIENCES.



REPORT OF THE COUNCIL. — PRESENTED MAY 13, 1908.

BIOGRAPHICAL NOTICE.

SAMUEL CABOT BY CHARLES LORING JACKSON.



REPORT OF THE COUNCIL.

The Academy has lost fourteen members by death since the last report of the Council,— five Resident Fellows, Charles F. Folsom, Edward G. Gardiner, George E. Davenport, Edward H. Strobel, Gustavus Hay; six Associate Fellows, T. D. Seymour, C. A. Young, Asaph Hall, I. C. Russell, A. St. Gaudens, E. C. Stedman; three Foreign Honorary Members, H. C. Vogel, Sir Benjamin Baker, Lord Kelvin.

Three Resident Fellows have resigned.

Seven Resident Fellows have been elected.

One Resident Fellow has been elected to Associate Fellowship.

The roll of the Academy now includes 187 Resident Fellows, 92 Associate Fellows, and 65 Foreign Honorary Members.

SAMUEL CABOT.

SAMUEL CABOT, the fourth of the name, was born February 18, 1850, in Boston, where his father was an eminent surgeon. His grandfather, a successful East India merchant in the days before commercial supremacy had left New England, married Elizabeth Perkins, the daughter of Thomas Handasyd Perkins, founder of the Perkins Institution for the Blind. His mother, Hannah Lowell Cabot, was the daughter of Patrick Tracy Jackson, of Boston, celebrated for the introduction of the manufacture of cotton goods into America at Waltham and Lowell, and of Lydia Cabot, of Beverly. He was therefore descended on each side from a family noted for rugged independence, sturdy honesty, and devotion to high ideals.

He was the oldest son but second child in a numerous family dominated by the high ideals of which I have just spoken, as his father was one of the most vigorous supporters of the antislavery cause when this could not be done without sacrifice, and in this and all other matters the pursuit of the highest at any cost was impressed on the children by the precept and example of both parents. The life in his earlier days in Boston, and in the summer at Canton, was of necessity simple; those were the days of small fees, when a surgeon, even of his father's eminence, gained an income barely sufficient for the support of

a large family. In fact, it was characteristic of Dr. Cabot that even to the day of his death he remained an uncompromising opponent to the high charges for surgical work which had already appeared. But if the life was simple, it was very full and happy; the family circle was bound together by a warm, almost passionate affection, and was surrounded by troops of friends both in Boston and in the country. All the burning questions of the day were discussed continually with great energy by the brothers and sisters, each one of whom was thoroughly convinced of the truth of his or her opinion and never backward in proclaiming it. The home atmosphere was therefore stimulating, both morally and mentally.

He was educated in the public schools, finally at the Boston Latin School, from which he graduated in 1866. Here he proved himself a painstaking but not brilliant scholar, as, like so many healthy boys, his interests were in athletic sports, especially baseball and football, rather than in his books.

On leaving the Latin School he was naturally attracted by the Massachusetts Institute of Technology, then in its infancy, since he inherited strong scientific tastes from his father, who was an excellent ornithologist and in his younger days had made scientific journeys. It is probable, however, that the impulse to chemistry came from the Jacksons, as his contemporaries in this family included nine professional chemists divided among three branches of the family, which had separated in the seventeenth century. If this does not indicate a strong family taste for chemistry, but is a mere coincidence, it is certainly a strange one, as chemistry is distinctly an unusual profession. Accordingly he entered the Institute in the third class received by it, and devoted his attention to chemistry principally under the direction of Professor F. H. Storer.

In 1870 he became chemist of the Merrimack Print Works at Lowell, and, while holding this position, introduced successfully a process for recovering alizarine from the spent residues of the madder root by the use of sulphuric acid, which was new to this country, — a remarkable achievement for a young man of twenty-two. It is striking to note that even as a beginner he was not content with the mere routine work of his position, but entered at once the field in which he was destined to reap such abundant harvests, for his principal merit lies in making effective, on a commercial scale, new processes, whether of his own invention or foreign ones as yet unknown in America. This adaptation of foreign processes is not by any means the simple matter which it might appear at first sight; great judgment is necessary in selecting the one best fitted to the needs of this country, and, after this is done.

the details must in many cases be reinvented, or, when not carefully guarded secrets, they usually need extensive modifications to fit them to American conditions, which differ in many and unexpected ways from those abroad. It would be a mistake, however, to suppose from this early success that he was a precocious genius, who leaped to results by some intuitive process; on the contrary, his mind moved rather slowly, and his early successes were obtained by patient, well-directed, persistent labor.

In 1873 he went to Europe to complete his chemical education, and studied for the first half year with Emil Kopp, in the Zürich Polytechnicum, where he gave part of his time to the analysis of aniline black, a dyestuff then recently introduced. The second half of the year was devoted to travel, and especially to visits to laboratories and chemical works. At this time he was only twenty-four years old, but it was striking to see the most eminent chemists receiving him as a fellow-chemist, and discussing scientific matters with him as with a contemporary. The acquaintanceships made at this time, and the practical knowledge acquired, were of life-long value to him.

In 1874, after his return to America with greater attainments and enlarged horizons, he attempted to establish at the Lowell Bleachery the Solvay process for making sodic carbonate, then only eleven years old, but without success. This is an excellent example of the difficulties in introducing foreign manufacturing processes. There was no lack of judgment in the selection of the process, as is shown by the enormous development of it at Syracuse, where it was started under the auspices of the mother company in Belgium ten years later; the details also seemed to be sufficiently well known, but the working out of these details so as to secure success needed not only the highest ability of the technical chemist, but also mechanical engineering of a most difficult and unusual sort, which at that time was beyond him. His failure, therefore, was not surprising or mortifying, and he had the happy faculty of learning from his failures, and, like Peter the Great, making them the school for later victories. After this he spent a short time in the office of his uncle, Henry Lee, learning business methods.

His only chemical papers date from this period, 1872-1877. They are seven in number and of good quality for a beginner, but he evidently soon realized that the publication of original researches was not his line of work, since he could be employed much more usefully for the community and himself in perfecting chemical manufactures. With this end in view he became the most expert consulting chemist for industrial work in this part of the country, and continued to give advice

of this sort, as he could find time, until his own manufactures absorbed his whole attention.

It was in 1877 that he began business on his own account in partnership with Frederick Nourse. They established a coal-tar distillery at Chelsea, from which he hoped to develop an industry in fine organic chemicals similar to that which was then showing such wonderful growth in Germany, but the time was not ripe for such a growth in America; in fact, even now, thirty years afterward, this industry has not yet emerged from its infancy. Accordingly he turned his attention to the less varied list of products for which he found a demand. Among these, lampblack was the most important, and he at once improved the apparatus for its manufacture in his usual thorough, painstaking way. Mr. Nourse retired from the partnership in the autumn of 1878, and after this he had sole charge of the business, keeping himself a firm grasp on all departments of it, with the assistance of a series of able managers, — his brother-in-law, Mr. C. P. Nichols, Mr. Edward Cunningham, Mr. W. R. Cabot, and Mr. M. G. Bennett.

Always on the lookout for new fields of work, his attention was called at an early day to the gas region of Pennsylvania, in which he hoped to find mineral wealth similar to that of the Midland region of England. Although these hopes were not fulfilled, the investigation led him to the establishment in 1882-1883 of a plant at Worthington, Pennsylvania, for making carbon black by burning natural gas against a cast-iron plate beneath which the burner and black-box revolved. This method, which was in part, perhaps wholly, original with him, is still in use in the largest factory for this product. After a few years, however (in 1888), his brother, Godfrey L. Cabot, who had worked with him for a short time, took this business off his hands, and has carried it on successfully ever since.

At about the same time he began the manufacture of sulpho-naphthol — one of the most excellent disinfectants known; and another profitable new industry, rendered effective by him somewhat later, was the preparation of creosote shingle stains. Many attempts had been made in foreign countries to use creosote as a basis for paint, but none of these had been crowned with success. He, however, had the penetration to see that such a paint or stain would be specially adapted for use with shingles, which were essentially unknown abroad, and after this a painstaking study of the details and great care and thoroughness in the manufacture led to a complete victory over the difficulties, which had proved too much for his predecessors. His insulating felt for deadening sound, keeping out cold, and fireproofing, was an entirely original idea. It consisted of eel-grass quilted between two

layers of asbestos or felting, and proved especially well adapted for these purposes, thus furnishing a use for a very cheap and hitherto worthless material.

Not every experiment was a success, however; as with all inventors, his path was strewn with failures, for it was not enough to make a process work, but it must also pay. Thus, for instance, he invented a set of stains on a creosote basis for interior use in houses, but, although admirable from the technical and artistic standpoints, the demand for them was so small that it was not worth while to manufacture them.

At the time of his death his principal products were shingle-stains, lampblack, deadening-felt, sulpho-naphthol, benzol, naphtha, brick preservative, sheep dip, mortar colors, black varnish, and coal-tar pitch. I give this list to show how far he had departed from his original plan of establishing a varied manufacture of fine chemicals, as it seems to me a remarkable proof of his sagacity that he was able to select products for which there was a demand, instead of wasting his energies on lines of work for which the country was not prepared.

One of his most interesting achievements was the successful establishment of a system of profit-sharing with the operatives of his factory. I am fortunately able to give an account of it in his own words, taken from an address on the subject delivered a few years ago before the American Social Science Association.

"At a very early period in my business experience it appeared to me that the rewards ordinarily offered to the wage-earner were not such as to stimulate him to the best exertion nor foster in him the best and kindest feelings toward his employer.

"Even to-day is it not true that in the great majority of cases the wage-earner's only stimulus is the desire to hold his job? In fact, is not the fear of discharge the only incentive to exertion in a large majority of cases?

"Feeling as I did, and still do, that men can always be led more successfully than they can be driven, that Hope as leader and captain can accomplish more than Fear as tyrant and slave-driver, I set myself — ignorantly and crudely to be sure, but earnestly — to try to do better things. My method has grown to be essentially as follows:

"Every man who enters my employ is given the current rate of wages for similar work. If he desires also to participate in the profit-sharing, he is required to sign a paper in which he promises to do his work as quickly and carefully as possible, remembering that the greater the yield the larger the profits, and to give me sixty days' notice before leaving me.

"On my part, I promise to divide, at the expiration of each six

months, a certain fraction of the profits among the participants, strictly in proportion to the wages of each during that period. This sum in each case is divided into two equal parts, one of which is given in cash to the employee and the other is deposited in a savings-bank by me as his trustee.

"This fund in the bank is in the nature of an insurance upon the life of the employee, and is given over with interest to his executors, if he dies. It, however, does not come back into my hands. If he should, for instance, refuse to give me sixty days' notice on leaving me, although he had already received an equal amount in cash upon the promise to give me such notice, the money would not come back to me, but would simply be distributed among the other participants at the next division.

"The same is true in case of his discharge for cause.

"In case of sickness I am empowered at my discretion to draw upon his fund, though in temporary cases I always put sick men on half-pay for a considerable time without recourse to their fund. I also have the right to lend him money upon it to build a house. And now let me give you a few figures.

"The system was begun a little over seventeen years ago, and has gone on uninterrupted up to the present time. The profit-sharers at the outset numbered 21, and to-day number 42. The total amount paid out by me has been \$40,464 during that period. Now the natural question which you all will ask, I think, is, Has this been a good bargain? I think you will all agree that in the ultimate analysis no bargain is a good bargain that is not profitable to both sides. Well, there will, I think, be no dispute that from the workman's point of view the bargain has been a good one, as he has a very considerable addition to his wages, which were as high as other labor of the same kind; and I may say that the average wages have steadily advanced as the efficiency and skill increased.

"But now comes the question of my own investment: What means have I of knowing that the efficiency of the workmen has been increased to an amount equivalent to the \$40,464 which I have expended?

"I will now give you a few more statistics which bear upon this question. Let me remind you that the same proportion of the profit was paid to the 21 men who first entered the agreement that is now paid to the 42 men who compose the present corps. But now note this very significant fact. While the first payments averaged about 10 per cent upon the wages of each man, the last payment — which was larger than usual, to be sure — was exactly $21\frac{3}{4}$ per cent of their wages.

"It seems to me obvious that, if we can draw any inference from these facts, it is that, inasmuch as my profit compared to the wages paid has increased, the efficiency of my workmen has improved.

"But, above all, my own observation has convinced me that the *morale* of my employees is much superior to the average, and that they are more contented and willing by far than is usual in similar establishments. In fact, I am satisfied that this bargain has been a good bargain, a good one for both parties to it, and that the extra money I have laid out has been well and profitably invested.

"I have, for obvious reasons, not laid any emphasis upon the philanthropic side of this enterprise, especially as I am sure it can be recommended to many, if not to most, manufacturers, and to their employees, purely upon its utilitarian advantages; but it is obvious that it stimulates both sobriety and thrift in workmen, and that it can be made to assist men of family to build homes for themselves, thus surrounding the factory with the homesteads of men who are interested in its success and that of the neighborhood.

"From my seventeen years' experience, therefore, gentlemen, I can cordially recommend profit-sharing on this or a similar plan as of marked advantage to both employer and employed."

I have quoted this paper almost entire, because it seems to me to show the man—his desire for the good of others, joined to sound business common sense, and the practical wisdom needed to make the scheme effective. That it was effective is shown by the fact that, when a new hand was inclined to be indolent, the other workmen insisted on vigorous work from him if he was to stay in the factory, for, said they, "We will not have our profits cut down by the lazy or inefficient." It will be observed that the success of this system depended on an absolute trust on the part of the men in the uprightness of their employer. The slightest suspicion that it would not be carried out equitably, or that in some underhand way it would redound to the profit of the chief, would have wrecked it at once. And here the comparatively small number of men was a potent factor, as they were all able to know Mr. Cabot personally, and to realize his absolute honesty and fairness. That they also learned to love him appeared from the impressive sorrow with which they attended his funeral.

This absolute honesty and fairness was also conspicuous in his business relations. He would often make concessions beyond what could be justly demanded, if he thought the claim was made in good faith, while, on the other hand, he would not yield an inch when this was not the case, but proved a dangerous and pertinacious adversary. In one case at a very early stage in his career a man who had circulated

malicious stories about his goods was forced to sign a written retraction couched in the most abject terms.

His business activities would have been enough to exhaust the energy of most men, but he found time and strength for the enthusiastic pursuit of many other interests. He was a most devoted son of the Institute of Technology, always ready with advice or more material help. In 1889 he was elected to the Corporation intrusted with its government, and in spite of his strong opinions and fighting blood won and kept the respect and affection of all his fellow-members. He was a member of the executive committee for many years, and very active on committees in charge of special departments, serving at various times on those on chemistry, chemical engineering, physics, botany, biology, modern languages, and English. His principal interest was naturally in the Chemical Department, which he watched over with unceasing care. He even induced Professor Lunge to come to Boston from Zürich to examine it, and make suggestions in regard to the best methods for teaching industrial chemistry.

Nor did he confine his attention to the Institute of Technology, as for many years he was a member of the "Committee to visit the Chemical Laboratory" of Harvard University, and in this capacity gave much useful advice about the organization of the course in industrial chemistry, in which he advocated the teaching of broad general principles rather than instruction in details, showing in this way a power of rising above the narrowing tendency of the highly specialized work by which alone a chemical manufacturer attains success.

He was devoted to athletics throughout his life, telling with gusto in one of his last years how he had beaten a much younger man at tennis, and about the same time causing the publication of a delightful volume of reminiscences by the idol of his boyhood, Lovett, the pitcher of the Lowells. This interest influenced his relations with the Institute of Technology, as he was a member of the Advisory Council on Athletics, and gave a tract of land in Brookline for a playground. He also established an annual prize for the greatest improvement in athletics, and gave a silver cup, on which the names of the victors were inscribed each year. It is almost needless to add that his influence was always used in maintaining the highest ideal of sportsmanship. In addition to these gifts for athletics he gave his house in Brookline for a dormitory, and was always ready to answer any pressing need.

He threw himself with the same enthusiasm into other recreations. Thus he made a careful study of the theory and construction of aeroplanes, for many years carrying on experiments in the summer on kites, studying especially the resistance of the air to various forms, and the

effect of atmospheric currents. While in Europe in 1896 he saw Maxim and Lillenthal, and provided the latter with money to carry on his work; and in this country he stood ready to help the Wright brothers, when the time should come to make their experiments public.

Another engrossing pursuit was the study of the authorship of the plays of Shakespeare. He espoused the Baconian theory with great vigor, and defended his position by elaborate and costly investigations. His fine taste for art made him an authority on this subject also, and proved of great use to him in some of the branches of his business.

He was elected a fellow of our Academy in 1893, and served on the C. M. Warren Committee from its establishment in the same year until his death. That he held no other office was from his own choice, since he was at one time elected treasurer of the Academy, but declined to serve. He was also a member of the Society for Chemical Industry.

In 1878 he married Helen Augusta Nichols, of Lowell, and they had two children, a daughter and a son. In his family and society his genial, affectionate nature won all hearts. It made one happier for the whole day simply to exchange a few words with him in the street.

This life, so full of various beneficent activities, was brought to an end by a sudden attack of pneumonia, November 26, 1906.

In looking back at his life the most striking characteristic was, I think, his very high standards. It was not enough that he should be successful from a worldly point of view, but in all his undertakings the good of the country was a prime consideration; the introduction of new and useful processes, the utilization of waste materials, were his objects quite as much as his own personal advantage. Further, all his products must be of the highest quality, all his processes brought to the highest perfection. His probity was without a flaw, and anything mean or underhanded aroused in him a scorching, disdainful wrath, — for he was always a fighter, never afraid of an outspoken expression of his opinion; yet even in his more vehement controversies his antagonists could never lose sight of his sincerity of purpose and his large, warm heart. With all his vehemence of opinion his character was a singularly gentle and affectionate one, so that his genial nature won the love of all who knew him well. His thoroughness in all his pursuits, and the good judgement with which he selected or abandoned his manufacturing experiments, have been dwelt on sufficiently in the narrative of his life; but not enough has been said there of his generosity — always on the watch to help the deserving, yet concealed so carefully that in one case at least even the person benefited did not know from whom the help had come. To these he added a modesty and humility which

led him always to undervalue his ability and attainments, a purity so feminine that it was respected even by the wilder men whom he chanced to encounter in his youth, and a strong and vivid imagination both in his experiments and recreations.

His ruddy face under a mass of curly hair always beamed with a genial light; and he seemed to glow with exuberant life and enthusiasm while he discussed some important subject in a slow rather hesitating manner, as if his abundant ideas found difficulty in gaining utterance. It seems impossible to believe that this overflowing vitality is no longer with us.

CHARLES LORING JACKSON.

American Academy of Arts and Sciences

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Class II.
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Class III.
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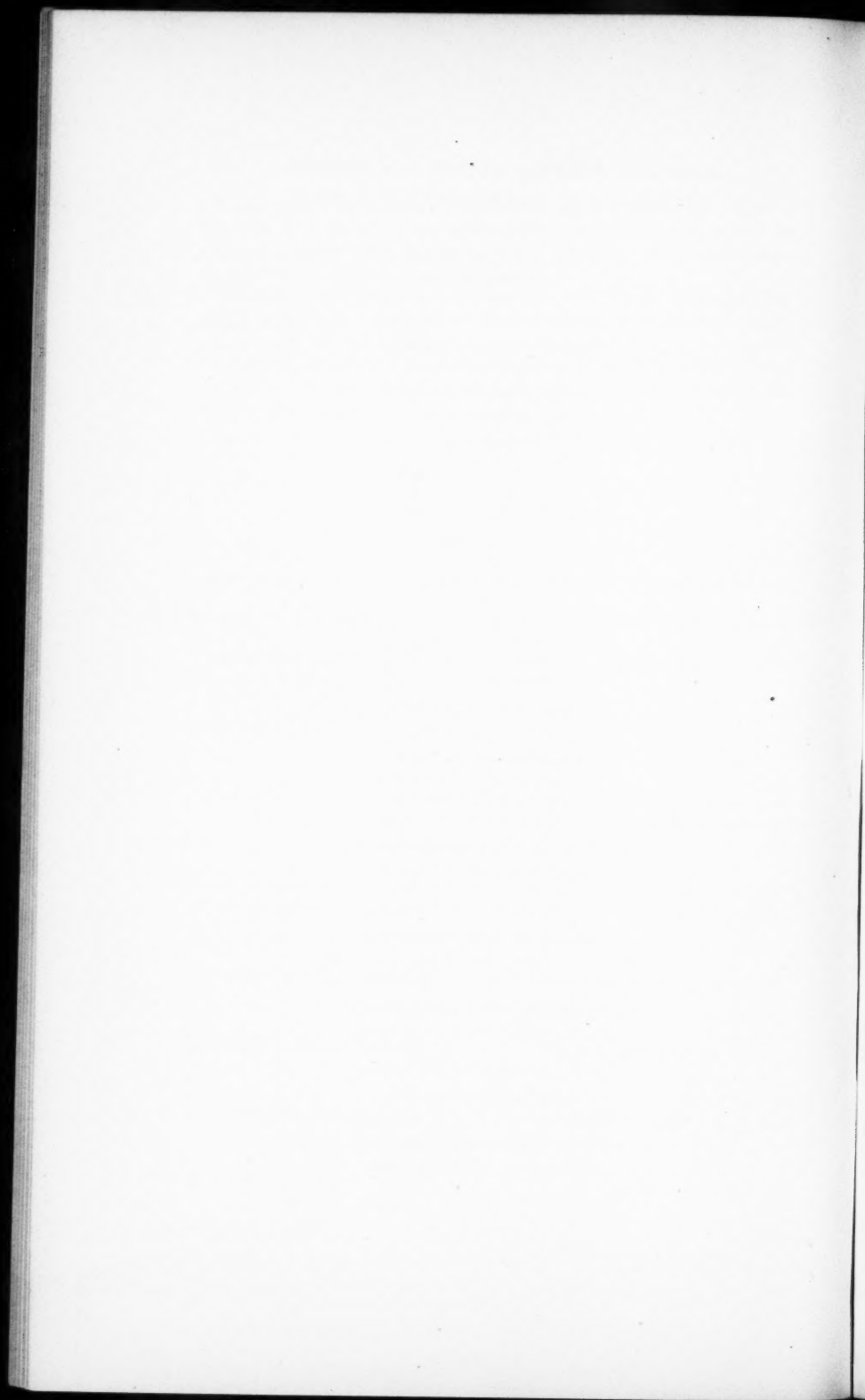
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WILLIAM R. WARE, *Chairman*.

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MORRIS H. MORGAN.



LIST

OF THE

FELLOWS AND FOREIGN HONORARY MEMBERS.

(Corrected to June 1, 1908.)

RESIDENT FELLOWS.—189.

(Number limited to two hundred.)

CLASS I.—*Mathematical and Physical Sciences.*—78.

SECTION I.—14.

Mathematics and Astronomy.

Solon I. Bailey,	Cambridge.
Maxime Bôcher,	Cambridge.
William E. Byerly,	Cambridge.
Seth C. Chandler,	Wellesley Hills.
Percival Lowell,	Boston.
Edward C. Pickering,	Cambridge.
William H. Pickering,	Cambridge.
John Ritchie, Jr.,	Dorchester.
Arthur Searle,	Cambridge.
William E. Story,	Worcester.
Henry Taber,	Worcester.
Harry W. Tyler,	Boston.
O. C. Wendell,	Cambridge.
P. S. Yendell,	Dorchester.

SECTION II.—27.

Physics.

A. Graham Bell,	Washington, D.C.
Louis Bell,	Boston.
Clarence J. Blake,	Boston.
Francis Blake,	Weston.
George A. Campbell,	New York.
Harry E. Clifford,	Newton.
Charles R. Cross,	Brookline.
Louis Derr,	Brookline.

A. W. Duff,	Worcester.
H. M. Goodwin,	Roxbury.
Edwin H. Hall,	Cambridge.
Hammond V. Hayes,	Cambridge.
William L. Hooper,	Somerville.
William W. Jacques,	Newton.
Frank A. Laws,	Boston.
Henry Lefavour,	Boston.
Theodore Lyman,	Brookline.
Charles L. Norton,	Boston.
Benjamin O. Peirce,	Cambridge.
George W. Pierce,	Cambridge.
A. Lawrence Rotch,	Boston.
Wallace C. Sabine,	Boston.
John S. Stone,	Boston.
Elihu Thomson,	Swampscott.
John Trowbridge,	Cambridge.
A. G. Webster,	Worcester.
Robert W. Willson,	Cambridge.

SECTION III.—19.

Chemistry.

Gregory Paul Baxter,	Cambridge.
Arthur M. Comey,	Cambridge.
James M. Crafts,	Boston.
Charles W. Eliot,	Cambridge.
Charles L. Jackson,	Cambridge.
Walter L. Jennings,	Worcester.

Leonard P. Kinnicutt,	Worcester.	Alfred E. Burton,	Boston.
Charles F. Mabery,	Cleveland, O.	Eliot C. Clarke,	Boston.
George D. Moore,	Worcester.	Heinrich O. Hofman,	Jamaica Plain.
James F. Norris,	Boston.	Ira N. Hollis,	Cambridge.
Arthur A. Noyes,	Boston.	L. J. Johnson,	Cambridge.
Robert H. Richards,	Jamaica Plain.	Arthur E. Kennelly,	Cambridge.
Theodore W. Richards,	Cambridge.	Gaetano Lanza,	Boston.
Charles R. Sanger,	Cambridge.	E. D. Leavitt,	Cambridge.
Stephen P. Sharples,	Cambridge.	William R. Livermore,	New York.
Francis H. Storer,	Boston.	Hiram F. Mills,	Lowell.
Henry P. Talbot,	Newton.	Cecil H. Peabody,	Brookline.
William H. Walker,	Newton.	Andrew H. Russell,	Paris.
Charles H. Wing,	Boston.	Albert Sauveur,	Cambridge.
		Peter Schwamb,	Arlington.
		H. L. Smyth,	Cambridge.
		George F. Swain,	Boston.
		William Watson,	Boston.

SECTION IV. — 18.

Technology and Engineering.

Comfort A. Adams, Cambridge.

CLASS II. — *Natural and Physiological Sciences.* — 59.

SECTION I. — 16.

Geology, Mineralogy, and Physics of the Globe.

H. H. Clayton,	Milton.
Algernon Coolidge,	Boston.
William O. Crosby,	Jamaica Plain.
William M. Davis,	Cambridge.
Benj. K. Emerson,	Amherst.
O. W. Huntington,	Newport, R. I.
Robert T. Jackson,	Cambridge.
T. A. Jaggar, Jr.,	Cambridge.
Douglas W. Johnson,	Cambridge.
William H. Niles,	Cambridge.
Charles Palache,	Cambridge.
John E. Pillsbury,	Washington.
Robert DeC. Ward,	Cambridge.
Charles H. Warren,	Auburndale.
John E. Wolff,	Cambridge.
J. B. Woodworth,	Cambridge.

SECTION II. — 11.

Botany.

F. S. Collins,	Malden.
William G. Farlow,	Cambridge.
Charles E. Faxon,	Jamaica Plain.
Merritt L. Fernald,	Cambridge.
George L. Goodale,	Cambridge.
John G. Jack,	Jamaica Plain.
Edward C. Jeffrey,	Cambridge.
B. L. Robinson,	Cambridge.
Charles S. Sargent,	Brookline.
Arthur B. Seymour,	Cambridge.
Roland Thaxter,	Cambridge.

SECTION III. — 21.

Zoölogy and Physiology.

Alexander Agassiz,	Cambridge.
Robert Amory,	Boston.

Henry P. Bowditch,	Jamaica Plain.	James C. White,	Boston.
William Brewster,	Cambridge.	William M. Woodworth,	Cambridge.
Louis Cabot,	Brookline.		
Walter B. Cannon,	Cambridge.		
William E. Castle,	Cambridge.		
Samuel F. Clarke,	Williamstown.		
W. T. Councilman,	Boston.		
Harold C. Ernst,	Jamaica Plain.		
Samuel Henshaw,	Cambridge.		
Edward L. Mark,	Cambridge.		
Charles S. Minot,	Milton.		
Edward S. Morse,	Salem.		
George H. Parker,	Cambridge.		
William T. Porter,	Boston.		
James J. Putnam,	Boston.		
Samuel H. Scudder,	Cambridge.		
William T. Sedgwick,	Boston.		

SECTION IV. — 11.

Medicine and Surgery.

Edward H. Bradford,	Boston.
Arthur T. Cabot,	Boston.
Reginald H. Fitz,	Boston.
Frederick I. Knight,	Boston.
Samuel J. Mixter,	Boston.
W. L. Richardson,	Boston.
Theobald Smith,	Jamaica Plain.
O. F. Wadsworth,	Boston.
Henry P. Walcott,	Cambridge.
John C. Warren,	Boston.
Francis H. Williams,	Boston.

CLASS III. — *Moral and Political Sciences.* — 52.

SECTION I. — 8.

Philosophy and Jurisprudence.

James B. Ames,	Cambridge.
Joseph H. Beale, Jr.,	Cambridge.
John C. Gray,	Boston.
Francis C. Lowell,	Boston.
Hugo Münsterberg,	Cambridge.
Josiah Royce,	Cambridge.
Frederic J. Stimson,	Dedham.
Samuel Williston,	Belmont.

SECTION II. — 19.

Philology and Archaeology.

Charles P. Bowditch,	Jamaica Plain.
Lucien Carr,	Cambridge.

Franklin Carter,	Williamstown.
J. W. Fewkes,	Washington.
William W. Goodwin,	Cambridge.
Henry W. Haynes,	Boston.
Albert A. Howard,	Cambridge.
Charles R. Lanman,	Cambridge.
David G. Lyon,	Cambridge.
George F. Moore,	Cambridge.
Morris H. Morgan,	Cambridge.
Frederick W. Putnam,	Cambridge.
Edward Robinson,	New York.
Edward S. Sheldon,	Cambridge.
Herbert Weir Smyth,	Cambridge.
F. B. Stephenson,	Boston.
Crawford H. Toy,	Cambridge.
John W. White,	Cambridge.
John H. Wright,	Cambridge.

SECTION III.—12.

Political Economy and History.

Charles F. Adams,	Lincoln.
Thomas N. Carver,	Cambridge.
Andrew McF. Davis,	Cambridge.
Ephraim Emerton,	Cambridge.
A. C. Goodell,	Salem.
Charles Gross,	Cambridge.
Henry C. Lodge,	Nahant.
A. Lawrence Lowell,	Boston.
James F. Rhodes.	Boston.
William Z. Ripley,	Newton.
Charles C. Smith,	Boston.
F. W. Taussig,	Cambridge.

SECTION IV.—13.

Literature and the Fine Arts.

Francis Bartlett,	Boston.
Arlo Bates,	Boston.
L. B. R. Briggs,	Cambridge.
Kuno Francke,	Cambridge.
Edward H. Hall,	Cambridge.
T. W. Higginson,	Cambridge.
George L. Kittredge,	Cambridge.
William C. Lane,	Cambridge.
Charles Eliot Norton,	Cambridge.
Denman W. Ross,	Cambridge.
William R. Ware,	Milton.
Herbert L. Warren,	Cambridge.
Barrett Wendell,	Boston.

ASSOCIATE FELLOWS. — 92.

(Number limited to one hundred. Elected as vacancies occur.)

CLASS I. — *Mathematical and Physical Sciences.* — 36.

SECTION I. — 12.

Mathematics and Astronomy.

Edward E. Barnard,	Williams Bay, Wis.
S. W. Burnham,	Williams Bay, Wis.
George Davidson,	San Francisco.
Fabian Franklin,	Baltimore.
George W. Hill,	W. Nyack, N.Y.
E. S. Holden,	New York.
Emory McClintock,	Morristown, N.J.
E. H. Moore,	Chicago.
Simon Newcomb,	Washington.
Charles L. Poor,	New York.
George M. Searle,	Washington.
J. N. Stockwell,	Cleveland, O.

SECTION II. — 6.

Physics.

Carl Barus,	Providence, R.I.
G. E. Hale,	Williams Bay, Wis.
T. C. Mendenhall,	Worcester.
A. A. Michelson,	Chicago.
E. L. Nichols,	Ithaca, N. Y.
M. I. Pupin,	New York.

SECTION III. — 10.

Chemistry.

Wolcott Gibbs,	Newport, R.I.
Frank A. Gooch,	New Haven.
Eugene W. Hilgard,	Berkeley, Cal.
S. W. Johnson,	New Haven.
J. W. Mallet,	Charlottesville, Va.
E. W. Morley,	W. Hartford, Conn.
Charles E. Munroe,	Washington.
John U. Nef,	Chicago, Ill.
J. M. Ordway,	New Orleans.
Ira Remsen,	Baltimore.

SECTION IV. — 8.

Technology and Engineering.

Henry L. Abbot,	Cambridge.
Cyrus B. Comstock,	New York. [Va.
W. P. Craighill,	Charlestown, W.
John Fritz,	Bethlehem, Pa.
James D. Hague,	New York.
F. R. Hutton,	New York.
William Sellers,	Edge Moor, Del.
Robt. S. Woodward,	Washington.

CLASS II. — *Natural and Physiological Sciences.* — 32.

SECTION I. — 9.

*Geology, Mineralogy, and Physics of
the Globe.*

Cleveland Abbe,	Washington.
George J. Brush,	New Haven.

T. C. Chamberlin,	Chicago.
Edward S. Dana,	New Haven.
Walter G. Davis,	Cordova, Arg.
Samuel F. Emmons,	Washington.
G. K. Gilbert,	Washington.
R. Pumpelly,	Newport, R.I.
Charles D. Walcott,	Washington.

SECTION II.—6.

Botany.

L. H. Bailey,	Ithaca, N. Y.
D. H. Campbell,	Palo Alto, Cal.
J. M. Coulter,	Chicago.
C. G. Pringle,	Charlotte, Vt.
John D. Smith,	Baltimore.
W. Trelease,	St. Louis.

SECTION III.—9.

Zöology and Physiology.

Joel A. Allen,	New York.
W. K. Brooks,	Lake Roland, Md.
C. B. Davenport,	Cold Spring Harbor, N. Y.
F. P. Mall,	Baltimore.

S. Weir Mitchell,	Philadelphia.
H. F. Osborn,	New York.
A. E. Verrill,	New Haven.
C. O. Whitman,	Chicago.
E. B. Wilson,	New York.

SECTION IV.—8.

Medicine and Surgery.

John S. Billings,	New York.
W. S. Halsted,	Baltimore.
Abraham Jacobi,	New York.
W. W. Keen,	Philadelphia.
William Osler,	Baltimore.
T. Mitchell Prudden,	New York.
Wm. H. Welch,	Baltimore.
H. C. Wood,	Philadelphia.

CLASS III.—*Moral and Political Sciences.*—24.

SECTION I.—6.

Philosophy and Jurisprudence.

Joseph H. Choate,	New York.
Melville W. Fuller,	Washington.
William W. Howe,	New Orleans.
Charles S. Peirce,	Milford, Pa.
G. W. Pepper,	Philadelphia.
T. R. Pynchon,	Hartford, Conn.

SECTION II.—6.

Philology and Archeology.

Timothy Dwight,	New Haven.
B. L. Gildersleeve,	Baltimore.
D. C. Gilman,	Baltimore.
T. R. Lounsbury,	New Haven.
Rufus B. Richardson,	New York.
A. D. White,	Ithaca, N. Y.

SECTION III.—7.

Political Economy and History.

Henry Adams,	Washington.
G. P. Fisher,	New Haven.
Arthur T. Hadley,	New Haven.
Henry C. Lea,	Philadelphia.
Alfred T. Mahan,	New York.
H. Morse Stephens,	Ithaca.
W. G. Sumner,	New Haven.

SECTION IV.—5.

Literature and the Fine Arts.

James B. Angell,	Ann Arbor, Mich.
H. H. Furness,	Wallingford, Pa.
R. S. Greenough,	Florence.
Herbert Putnam,	Washington.
John S. Sargent,	London.

FOREIGN HONORARY MEMBERS.—65.

(Number limited to seventy-five. Elected as vacancies occur.)

CLASS I.—*Mathematical and Physical Sciences.*—20.

SECTION I.—6.

Mathematics and Astronomy.

Arthur Auwers,	Berlin.
George H. Darwin,	Cambridge.
Sir William Huggins,	London.
Felix Klein,	Göttingen.
Émile Picard,	Paris.
H. Poincaré,	Paris.

SECTION II.—5.

Physics.

Oliver Heaviside,	Newton Abbot.
F. Kohlrausch,	Marburg.
Joseph Larmor,	Cambridge.
Lord Rayleigh,	Witham.
Joseph J. Thomson,	Cambridge.

SECTION III.—6.

Chemistry.

Adolf Ritter von Baeyer,	Munich.
Emil Fischer,	Berlin.
J. H. van't Hoff,	Berlin.
Wilhelm Ostwald,	Leipsic.
Sir H. E. Roscoe,	London.
Julius Thomsen,	Copenhagen.

SECTION IV.—3.

Technology and Engineering.

Maurice Lévy,	Paris.
H. Müller-Breslau,	Berlin.
W. Cawthorne Unwin,	London.

CLASS II.—*Natural and Physiological Sciences.*—22.

SECTION I.—4.

Geology, Mineralogy, and Physics of the Globe.

Sir Archibald Geikie,	London.
Julius Hann,	Vienna.
Albert Heim,	Zürich.
Sir John Murray,	Edinburgh.

SECTION II.—6.

Botany.

E. Bornet,	Paris.
A. Engler,	Berlin.
Sir Joseph D. Hooker,	Sunningdale.
W. Pfeffer,	Leipsic.
H. Graf zu Solms-	
Laubach,	Strassburg.
Eduard Strasburger,	Bonn.

SECTION III.—5.

Zoölogy and Physiology.

Ludimar Hermann,	Königsberg.
H. Kronecker,	Bern.
E. Ray Lankester,	London.
Elias Metschnikoff,	Paris.
M. Gustav Retzius,	Stockholm.

SECTION IV.—7.

Medicine and Surgery.

Emil von Behring,	Marburg.
Sir T. L. Bruntton,	London.
A. Celli,	Rome.
Sir V. A. H. Horsley,	London.
R. Koch,	Berlin.
Lord Lister,	London.
F. v. Recklinghausen,	Strassburg.

CLASS III.—*Moral and Political Sciences.*—23.

SECTION I.—5.

Philosophy and Jurisprudence.

A. J. Balfour,	Prestonkirk.
Heinrich Brunner,	Berlin.
A. V. Dicey,	Oxford.
F. W. Maitland,	Cambridge.
Sir Frederick Pollock,	
Bart.,	London.

SECTION III.—5.

Political Economy and History.

James Bryce,	London.
Adolf Harnack,	Berlin.
Sir G. O. Trevelyan,	
Bart.,	London.
John Morley,	London.
Pasquale Villari,	Florence.

SECTION II.—7.

Philology and Archæology.

Ingram Bywater,	Oxford.
F. Delitzsch,	Berlin.
Hermann Diels,	Berlin.
W. Dörpfeld,	Athens.
Sir John Evans,	Berkhampsted.
H. Jackson,	Cambridge.
G. C. C. Maspero,	Paris.

SECTION IV.—6.

Literature and the Fine Arts.

E. de Amicis,	Turin.
Gaston Boissier,	Paris.
Georg Brandes,	Copenhagen.
S. H. Butcher,	London.
Jean Léon Gérôme,	Paris.
Rudyard Kipling,	Burwash.

STATUTES AND STANDING VOTES.

STATUTES.

Adopted May 30, 1854: amended September 8, 1857, November 12, 1862, May 24, 1864, November 9, 1870, May 27, 1873, January 26, 1876, June 16, 1886, October 8, 1890, January 11, and May 10, 1893, May 9, and October 10, 1894, March 13, April 10, and May 8, 1895, May 8, 1901, January 8, 1902, May 10, 1905, February 14 and March 14, 1906.

CHAPTER I.

OF FELLOWS AND FOREIGN HONORARY MEMBERS.

1. The Academy consists of Resident Fellows, Associate Fellows, and Foreign Honorary Members. They are arranged in three Classes, according to the Arts and Sciences in which they are severally proficient, viz.: Class I. The Mathematical and Physical Sciences;—Class II. The Natural and Physiological Sciences;—Class III. The Moral and Political Sciences. Each Class is divided into four Sections, viz.: Class I., Section 1. Mathematics and Astronomy;—Section 2. Physics;—Section 3. Chemistry;—Section 4. Technology and Engineering. Class II., Section 1. Geology, Mineralogy, and Physics of the Globe;—Section 2. Botany; Section 3. Zoölogy and Physiology;—Section 4. Medicine and Surgery. Class III., Section 1. Theology, Philosophy, and Jurisprudence;—Section 2. Philology and Archæology;—Section 3. Political Economy and History;—Section 4. Literature and the Fine Arts.

2. The number of Resident Fellows residing in the Commonwealth of Massachusetts shall not exceed two hundred, of whom there shall not be more than eighty in any one of the three classes. Only residents in the Commonwealth of Massachusetts shall be eligible to election as Resident Fellows, but resident fellowship may be retained after removal from

the Commonwealth. Each Resident Fellow shall pay an admission fee of ten dollars and such annual assessment, not exceeding ten dollars, as shall be voted by the Academy at each annual meeting. Resident Fellows only may vote at the meetings of the Academy.

3. The number of Associate Fellows shall not exceed one hundred, of whom there shall not be more than forty in either of the three classes of the Academy. Associate Fellows shall be chosen from persons residing outside of the Commonwealth of Massachusetts. They shall not be liable to the payment of any fees or annual dues, but on removing within the Commonwealth they may be transferred by the Council to resident fellowship as vacancies there occur.

4. The number of Foreign Honorary Members shall not exceed seventy-five; and they shall be chosen from among persons most eminent in foreign countries for their discoveries and attainments in either of the three departments of knowledge above enumerated. There shall not be more than thirty Foreign Members in either of these departments.

CHAPTER II.

OF OFFICERS.

1. There shall be a President, three Vice-Presidents, one for each Class, a Corresponding Secretary, a Recording Secretary, a Treasurer, and a Librarian, which officers shall be annually elected, by ballot, at the annual meeting, on the second Wednesday in May.

2. There shall be nine Councillors, chosen from the Resident Fellows. At each annual meeting, three Councillors shall be chosen, by ballot, one from each Class, to serve for three years; but the same Fellow shall not be eligible for two successive terms. The nine Councillors, with the President, the three Vice-Presidents, the two Secretaries, the Treasurer, and the Librarian, shall constitute the Council. Five members shall constitute a quorum. It shall be the duty of this Council to exercise a discreet supervision over all nominations and elections. With the consent of the Fellow interested, they shall have power to make transfers between the several sections of the same Class, reporting their action to the Academy.

3. The Council shall at its March Meeting receive reports from the Rumford Committee, the C. M. Warren Committee, the Committee on Publication, the Committee on the Library, the President and Record-

ing Secretary, and the Treasurer, proposing the appropriations for their work during the year beginning the following May. The Treasurer at the same meeting shall report on the income which will probably be received on account of the various Funds during the same year.

At the Annual Meeting, the Council shall submit to the Academy, for its action, a report recommending the appropriations which in the opinion of the Council should be made for the various purposes of the Academy.

4. If any office shall become vacant during the year, the vacancy shall be filled by a new election, at the next stated meeting, or at a meeting called for this purpose.

CHAPTER III.

OF NOMINATIONS OF OFFICERS.

1. At the stated meeting in March, the President shall appoint a Nominating Committee of three Resident Fellows, one for each Class.

2. It shall be the duty of this Nominating Committee to prepare a list of candidates for the offices of President, Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, Librarian, Councillors, and the Standing Committees which are chosen by ballot; and to cause this list to be sent by mail to all the Resident Fellows of the Academy not later than four weeks before the Annual Meeting.

3. Independent nominations for any office, signed by at least five Resident Fellows, and received by the Recording Secretary not less than ten days before the Annual Meeting, shall be inserted in the call for the Annual Meeting, which shall then be issued not later than one week before that meeting.

4. The Recording Secretary shall prepare for use, in voting at the Annual Meeting, a ballot containing the names of all persons nominated for office under the conditions given above.

5. When an office is to be filled at any other time than at the Annual Meeting, the President shall appoint a Nominating Committee in accordance with the provisions of Section 1, which shall announce its nomination in the manner prescribed in Section 2 at least two weeks before the time of election. Independent nominations, signed by at least five Resident Fellows and received by the Recording Secretary not later than one week before the meeting for election, shall be inserted in the call for that meeting.

CHAPTER IV.

OF THE PRESIDENT.

1. It shall be the duty of the President, and, in his absence, of the senior Vice-President present, or next officer in order as above enumerated, to preside at the meetings of the Academy; to direct the Recording Secretary to call special meetings; and to execute or to see to the execution of the Statutes of the Academy. Length of continuous membership in the Academy shall determine the seniority of the Vice-Presidents.

2. The President, or, in his absence, the next officer as above enumerated, shall nominate members to serve on the different committees of the Academy which are not chosen by ballot.

3. Any deed or writing to which the common seal is to be affixed shall be signed and sealed by the President, when thereto authorized by the Academy.

CHAPTER V.

OF STANDING COMMITTEES.

1. At the Annual Meeting there shall be chosen the following Standing Committees, to serve for the year ensuing, viz.: —

2. The Committee on Finance to consist of three Fellows to be chosen by ballot, who shall have, through the Treasurer, full control and management of the funds and trusts of the Academy, with the power of investing and of changing the investment of the same at their discretion.

3. The Rumford Committee, to consist of seven Fellows to be chosen by ballot, who shall consider and report to the Academy on all applications and claims for the Rumford premium. They shall also report to the Council in March of each year on all appropriations of the income of the Rumford Fund needed for the coming year, and shall generally see to the due and proper execution of the trust. All bills incurred on account of the Rumford Fund, within the limits of the appropriation made by the Academy, shall be approved by the Chairman of the Rumford Committee.

4. The C. M. Warren Committee, to consist of seven Fellows to be chosen by ballot, who shall consider and report to the Council in March of each year on all applications for appropriations from the income of the C. M. Warren Fund for the coming year, and shall generally see to the due

and proper execution of the trust. All bills incurred on account of the C. M. Warren Fund, within the limits of the appropriations made by the Academy, shall be approved by the Chairman of the C. M. Warren Committee.

5. The Committee on Publication, to consist of three Fellows, one from each class, to whom all communications submitted to the Academy for publication shall be referred, and to whom the printing of the Proceedings and Memoirs shall be entrusted. This Committee shall report to the Council in March of each year on the appropriations needed for the coming year. All bills incurred on account of publications, within the limits of the appropriations made by the Academy, shall be approved by the Chairman of the Committee on Publication.

6. The Committee on the Library, to consist of the Librarian *ex officio*, and three other Fellows, one from each class, who shall examine the Library and make an annual report on its condition and management. This Committee, through the Librarian, shall report to the Council in March of each year, on the appropriations needed for the Library for the coming year. All bills incurred on account of the Library, within the limits of the appropriations made by the Academy, shall be approved by the Librarian.

7. The President and Recording Secretary shall be a Committee on the general expenditures of the Academy. This Committee shall report to the Council in March of each year on the appropriations needed for the general expenditures for the coming year, and either member of the Committee may approve bills incurred on this account within the limits of the appropriations made by the Academy.

8. An auditing Committee, to consist of two Fellows, for auditing the accounts of the Treasurer, with power to employ an expert and to approve his bill.

9. In the absence of the Chairman of any Committee, bills may be approved by a member of the Committee designated by the Chairman for the purpose.

CHAPTER VI.

OF THE SECRETARIES.

1. The Corresponding Secretary shall conduct the correspondence of the Academy, recording or making an entry of all letters written in its name, and preserving on file all letters which are received; and at each

meeting he shall present the letters which have been addressed to the Academy since the last meeting. Under the direction of the Council, he shall keep a list of the Resident Fellows, Associate Fellows, and Foreign Honorary Members, arranged in their Classes and in Sections in respect to the special sciences in which they are severally proficient; and he shall act as secretary to the Council.

2. The Recording Secretary shall have charge of the Charter and Statute-book, journals, and all literary papers belonging to the Academy. He shall record the proceedings of the Academy at its meetings; and after each meeting is duly opened, he shall read the record of the preceding meeting. He shall notify the meetings of the Academy, apprise officers and committees of their election or appointment, and inform the Treasurer of appropriations of money voted by the Academy. He shall post up in the Hall a list of the persons nominated for election into the Academy; and when any individual is chosen, he shall insert in the record the names of the Fellows by whom he was nominated.

3. The two Secretaries, with the Chairman of the Committee of Publication, shall have authority to publish such of the records of the meetings of the Academy as may seem to them calculated to promote its interests.

4. Every person taking any books, papers, or documents belonging to the Academy and in the custody of the Recording Secretary, shall give a receipt for the same to the Recording Secretary.

CHAPTER VII.

OF THE TREASURER.

1. The Treasurer shall give such security for the trust reposed in him as the Academy shall require.

2. He shall receive all moneys due or payable to the Academy and all bequests and donations made to the Academy. He shall pay all bills due by the Academy, when approved by the proper officers (except those of the Treasurer's office, which may be paid without such approval). He shall sign all leases of real estate in the name of the Academy. All transfers of stocks, bonds, and other securities belonging to the Academy shall be made by the Treasurer with the written consent of one member of the Committee of Finance. He shall keep an account of all receipts and expenditures, shall submit his accounts annually to the Auditing

Committee, and shall report the same at the expiration of his term of office or whenever called on so to do by the Academy or Council.

3. The Treasurer shall keep separate accounts of the income and appropriation of the Rumford Fund and of other special funds, and report the same annually.

4. The Treasurer may appoint an Assistant Treasurer to perform his duties, for whose acts, as such assistant, the Treasurer shall be responsible; or the Treasurer may employ any Trust Company, doing business in Boston, as agent to perform his duties, the compensation of such Assistant Treasurer or agent to be paid from the funds of the Academy.

CHAPTER VIII.

OF THE LIBRARIAN AND LIBRARY.

1. It shall be the duty of the Librarian to take charge of the books, to keep a correct catalogue of them, to provide for the delivery of books from the Library, and to appoint such agents for these purposes as he may think necessary. He shall make an annual report on the condition of the Library.

2. The Librarian, in conjunction with the Committee on the Library, shall have authority to expend such sums as may be appropriated, either from the General, Rumford, or other special Funds of the Academy, for the purchase of books, periodicals, etc., and for defraying other necessary expenses connected with the Library.

3. To all books in the Library procured from the income of the Rumford Fund, or other special funds, the Librarian shall cause a stamp or label to be affixed, expressing the fact that they were so procured.

4. Every person who takes a book from the Library shall give a receipt for the same to the Librarian or his assistant.

5. Every book shall be returned in good order, regard being had to the necessary wear of the book with good usage. If any book shall be lost or injured, the person to whom it stands charged shall replace it by a new volume or set, if it belongs to a set, or pay the current price of the volume or set to the Librarian; and thereupon the remainder of the set, if the volume belonged to a set, shall be delivered to the person so paying for the same.

6. All books shall be returned to the Library for examination at least one week before the Annual Meeting.

7. The Librarian shall have custody of the Publications of the Academy. With the advice and consent of the President, he may effect exchanges with other associations.

CHAPTER IX.

OF MEETINGS.

1. There shall be annually four stated meetings of the Academy; namely, on the second Wednesday in May (the Annual Meeting), on the second Wednesday in October, on the second Wednesday in January, and on the second Wednesday in March. At these meetings, only, or at meetings adjourned from these and regularly notified, or at special meetings called for the purpose, shall appropriations of money be made, or alterations of the statutes or standing votes of the Academy be effected.

Special meetings shall be called by the Recording Secretary at the request of the President or of a Vice-President or of five Fellows. Notifications of the special meetings shall contain a statement of the purpose for which the meeting is called.

2. Fifteen Resident Fellows shall constitute a quorum for the transaction of business at a stated or special meeting. Seven Fellows shall be sufficient to constitute a meeting for scientific communications and discussions.

3. The Recording Secretary shall notify the meetings of the Academy to each Resident Fellow; and he may cause the meetings to be advertised, whenever he deems such further notice to be needful.

CHAPTER X.

OF THE ELECTION OF FELLOWS AND HONORARY MEMBERS.

1. Elections shall be made by ballot, and only at stated meetings.

2. Candidates for election as Resident Fellows must be proposed by two Resident Fellows of the section to which the proposal is made, in a recommendation signed by them; and this recommendation shall be transmitted to the Corresponding Secretary, and by him referred to the Council. No person recommended shall be reported by the Council as a

candidate for election, unless he shall have received the approval of at least five members of the Council present at a meeting. All nominations thus approved shall be read to the Academy at any meeting, and shall then stand on the nomination list until the next stated meeting, and until the balloting. No person shall be elected a Resident Fellow, unless he shall have been resident in this Commonwealth one year next preceding his election. If any person elected a Resident Fellow shall neglect for one year to pay his admission fee, his election shall be void; and if any Resident Fellow shall neglect to pay his annual assessments for two years, provided that his attention shall have been called to this article, he shall be deemed to have abandoned his Fellowship; but it shall be in the power of the Treasurer, with the consent of the Council, to dispense (*sub silentio*) with the payment both of the admission fee and of the assessments, whenever in any special instance he shall think it advisable so to do.

3. The nomination and election of Associate Fellows shall take place in the manner prescribed in reference to Resident Fellows.

4. The nomination and election of Foreign Honorary Members shall take place in the manner prescribed for Resident Fellows, except that the nomination papers shall be signed by at least seven members of the Council before being presented to the Academy.

5. Three-fourths of the ballots cast must be affirmative, and the number of affirmative ballots must amount to eleven to effect an election of Fellows or Foreign Honorary Members.

6. If, in the opinion of a majority of the entire Council, any Fellow — Resident or Associate — shall have rendered himself unworthy of a place in the Academy, the Council shall recommend to the Academy the termination of his Fellowship; and provided that a majority of two-thirds of the Fellows at a stated meeting, consisting of not less than fifty Fellows, shall adopt this recommendation, his name shall be stricken off the roll of Fellows.

CHAPTER XI.

OF AMENDMENTS OF THE STATUTES.

1. All proposed alterations of the Statutes, or additions to them, shall be referred to a committee, and, on their report at a subsequent stated meeting or a special meeting called for the purpose, shall require for

enactment a majority of two-thirds of the members present, and at least eighteen affirmative votes.

2. Standing votes may be passed, amended, or rescinded at a stated meeting, or a special meeting called for the purpose by a majority of two-thirds of the members present. They may be suspended by a unanimous vote.

CHAPTER XII.

OF LITERARY PERFORMANCES.

1. The Academy will not express its judgment on literary or scientific memoirs or performances submitted to it, or included in its publications.

STANDING VOTES.

1. Communications of which notice has been given to the Secretary shall take precedence of those not so notified.

2. Associate Fellows, Foreign Honorary Members, and Resident Fellows, who have paid all fees and dues chargeable to them, are entitled to receive one copy of each volume or article printed by the Academy on application to the Librarian personally or by written order within two years of the date of publication. Exceptions to this rule may be made in special cases by vote of the Academy.

3. The Committee of Publication shall fix from time to time the price at which the publications of the Academy may be sold. But members may be supplied at half this price with volumes which they are not entitled to receive free, and which are needed to complete their sets.

4. Two hundred extra copies of each paper accepted for publication in the Memoirs or Proceedings of the Academy shall be placed at the disposal of the author, free of charge.

5. Resident Fellows may borrow and have out from the Library six volumes at any one time, and may retain the same for three months, and no longer.

6. Upon special application, and for adequate reasons assigned, the Librarian may permit a larger number of volumes, not exceeding twelve, to be drawn from the Library for a limited period.

7. Works published in numbers, when unbound, shall not be taken from the Hall of the Academy, except by special leave of the Librarian.

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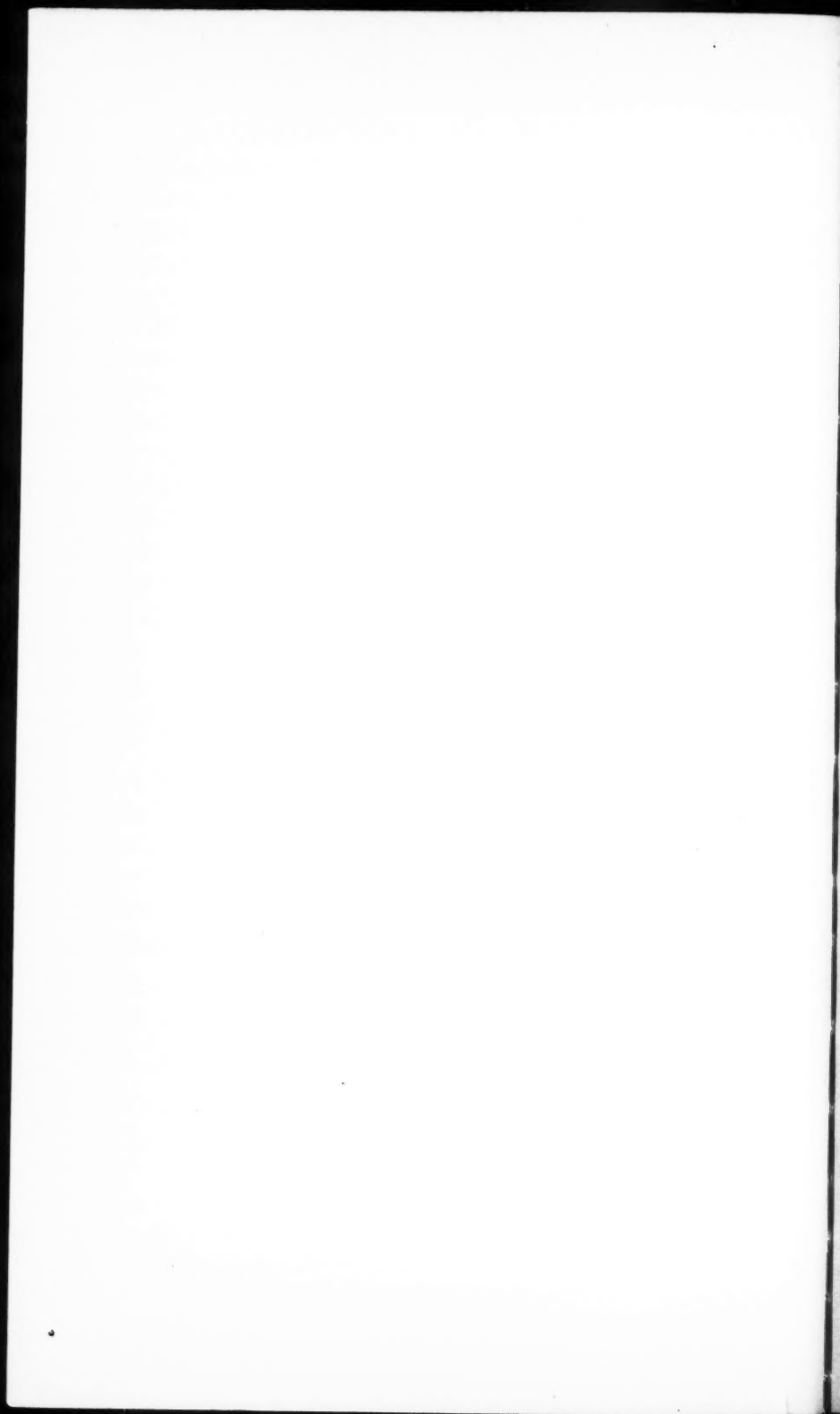
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